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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/386,734	08/31/99	RITZDORF	T SEMT-1-16048

026389

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CHRISTENSEN, O CONNOR, JOHNSON, KINDNESS

1420 FIFTH AVENUE

SUITE 2800

SEATTLE WA 98101-2347

EXAMINER

WYSZOMIERSKI, G

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 06/20/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/386,734

Applicant(s)

RITZDORF ET AL.

Examiner

George P Wyszomierski

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-40 and 68-76 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-40 and 68-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8,9,13,16
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

Art Unit: 1742

1. Claims 38, 39, and 69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) In claims 38 and 39, the meaning of "the direction of formation of the metal material" is unclear, i.e. does applicant mean the direction in which the metal material travels as it is formed (toward the surface of the workpiece), or the direction in which the metal material builds up as it is formed (away from the surface of the workpiece)?

b) In claim 69, the scope of the phrase "a temperature that is at or below about 250 to 300 degrees Celsius" is uncertain. For example, a temperature of 270 degrees Celsius is clearly below 300 degrees Celsius, is arguably below about 300 degrees Celsius, but is clearly not below 250 degrees Celsius. Clarification is required.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 36-40 and 68-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. (U.S. Patent 6,123,825).

Uzoh discloses electroplating a copper layer upon a surface of a workpiece and annealing at a temperature which would appear to meet the conditions as set forth in instant claims 36, 68, and 69. The disclosure of the Uzoh patent is drawn largely to the use of barrier layers and seed layers (as recited in instant claims 71-76) in such a process.

With respect to instant claim 70, Uzoh does not specify both annealing and cooling within a single chamber. However, this limitation as claimed appears to define merely an apparatus limitation upon the claimed process, and such does not render an otherwise known process patentable; see *In re Sweeney* (72 USPQ 501). Also, the examiner submits that if one were to anneal using an atmosphere such as hydrogen or forming gas (such as mentioned at Uzoh column 8, line 4) then one would want to do so in a closed system, in order to prevent gas from escaping into the atmosphere.

Uzoh differs from the claimed invention in that Uzoh does not recite that the prior art process will "fill sub-micron recessed structures in the surface of the workpiece", and does not recite the directional limitations and temperature gradient of instant claims 38-40. These differences are not seen as resulting in a patentable distinction between the Uzoh disclosure and the invention because:

a) The copper as deposited in the prior art process will inherently fill in at least some sub-micron sized imperfections in the surface as coated in the Uzoh process, i.e. no surface is completely flat on a molecular level, and some copper molecules will be introduced into recessed portions of the surface during the electrodepositing steps of Uzoh.

b) Any elevated temperature annealing process involves subjecting the material being annealed to a heat source, and the temperature of a portion of the material nearest to that heat source would be higher than a temperature of a portion further from the heat source. Therefore, to conduct the annealing step as disclosed in the prior art while creating the presently claimed temperature gradient would fall within the purview of the prior art disclosure.

Consequently, the disclosure of Uzoh et al. is held to create a prima facie case of obviousness of the presently claimed invention.

Art Unit: 1742

4. In remarks filed with the amendment of June 13, 2001, Applicant presents arguments with respect to various prior art references which were applied against the claims in Paper no. 7. Applicant's arguments are considered moot, in view of the newly cited Uzoh reference, which is clearly more relevant to the present invention than any of the previously applied art.

5. The remainder of the art cited on the enclosed PTO-1449 forms is of interest. This art is held to be no more relevant tot the instant claims than the art as applied in the rejections, supra.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (703) 308-2531. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (703) 308-1146. The fax phone number for this Group is (703) 305-7719. The Right fax number for this examiner is (703) 872-9039. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

GPW

June 14, 2001